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26. FIELD OBSERVATIONS ON THE OCCURRENCE OF *MICRONECTA SCUTELLARIS* STAL. (HEMIPTERA: CORIXIDAE)

(*With a text-figure*)

The water bug, *Micronecta scutellaris* Stal. is very common in stagnant water in ponds, pools and ditches. Abundance of this bug was observed in the three ponds of Aligarh district and was found to be influenced by the increase in percentage of organic matter in the water. Alkalinity of water beyond pH 8.5 has an adverse effect on the population density of *M. scuttellaris*. The temperature within the observed range (16.5-32.3°C) did not affect the occurrence of this species.

Introduction

Micronecta scutellaris Stal. (Fam: Corixidae) is usually found in stagnant water in ponds, pools and ditches in many parts of the world almost throughout the year (Butler 1923). *M. scutellaris* and several other species of the family Corixidae are the preferred food of poultry, cage birds and fishes in many countries. In Mexico, the eggs are collected by placing reeds in the water (Aucona 1933) and are used as human food (Hungerford 1948). In view of this importance it was considered desirable to study the distribution of *M. scutellaris* under Indian climatic conditions and also the environmental factors that determine their abundance.

Material and Methods

The abundance of *M. scutellaris* was studied over a period of twelve months from October 1971 to September 1972 in three different ponds in Aligarh. One of these Nilichhetri pond is about 30.0 metres in length and 10.0 metres in width. The second was Jamalpur pond which is about 25 x 8 metres in area. The main source of water in these ponds is rain. The polytechnic pond, the third is small, spherical, cemented and about 5 metres in diameter and largely has tap water.

The bugs were collected from the ponds with a hand net on every Sunday. On each sampling day two collections were made, one at 8.00 hr and other at 16.00 hr. Each sample was subjected to differential numerical analysis and mean of all the counts, made for all samples collected during a month in a Centre, was taken as representing the monthly average and plotted against the respective month. The percentage of organic matter in the soil was measured by the ignition of dried samples. Temperature of the water was noted and pH was determined by means of pH paper on the spot during each collection.

Results and Discussion

The various hydrological features at sampling sites during the period of study are given

TABLE 1
MONTHLY FLUCTUATION IN VARIOUS HYDROLOGICAL FEATURES AT SAMPLING SITES

Month	% o.m.s. Jamal. pond				Temperature °C			pH		
	Nil. pond	Drain end	opposite end	Poly. pond	Nil. pond	Jamal. pond	Poly. pond	Nil. pond	Jamal. pond	Poly. pond
Nov. 1971	4.9	15.9	11.3	3.6	20.6	20.5	20.5	7.5	7.7	7.7
Dec. 1971	5.9	16.3	11.1	3.9	16.5	16.8	16.6	7.3	8.6	8.2
Jan. 1972	6.3	16.5	10.9	4.3	16.3	16.8	16.6	7.5	8.5	7.9
Feb. „	5.6	16.5	11.3	4.8	17.0	16.8	17.2	7.9	8.7	8.1
March „	6.4	15.8	11.5	4.6	22.8	23.3	23.6	8.7	9.5	8.0
April „	6.9	15.8	11.1	5.3	27.8	27.5	28.0	8.4	9.7	8.2
May „	7.6	19.5	11.3	4.8	29.3	29.0	30.0	8.3	8.8	9.0
June „	8.1	17.3	10.8	5.6	29.5	29.0	30.1	8.4	8.7	8.7
July „	8.2	16.7	11.5	5.3	30.1	29.1	30.5	8.1	8.3	8.3
August „	7.6	16.7	10.9	4.4	32.3	32.0	32.3	7.6	7.7	8.3
Sept. „	8.0	16.5	11.4	4.9	31.0	31.0	31.6	8.1	8.2	8.5
Oct. „	7.9	16.8	11.1	4.9	27.9	28.6	28.1	8.3	7.8	8.1

in table 1. The seasonal abundance of *M. scutellaris* in these ponds is presented in Fig. 1 The results obtained showed that the amount of organic matter and pH of water can affect the population density of *M. scutellaris,* while temperature, within the observed range, was not found to be the determining factor of the seasonal abundance of *M. scutellaris.*

Effect of organic matter:

The percentage of organic matter in an aquatic soil has been shown to be an important factor in the distribution of certain species of Corixidae (Macan 1938). During the present observations, the percentage of organic matter of Nilichhatri pond ranged from 4.9 to 8.2 while it was 10.8-19.5 per cent in Jamalpur pond. As polytechnic pond is small, cemented and mainly filled with tap water, the % o.m.s. was very less and ranged from 3.6 to 5.6. The population density of *M. scutellaris* was observed the highest in Jamalpur pond throughout the year. This may be due to high percentage of decaying organic matter especially at a point where human and animal excrements were drained into the pond. This fact was further confirmed by making collection from the drain end and the opposite end of the pond. Due to higher percentage of organic matter at the drain end (15.8-19.5) than at the opposite end (10.8-11.5) the population of *M. scutellaris* was significantly higher at the drain end.

The population density of *M. scutellaris* was directly proportional to the percentage of the organic matter present in the water. The percentage of organic matter was 16.6, 6.95 and 4.68 in the water of Jamalpur, Nilichhatri and Polytechnic pond respectively and consequently the population density of *M. scutellaris* was the highest in Jamalpur pond and then in Nilichhatri and Polytechnic ponds (Fig. 1). This confirms my earlier findings (1977), that decaying organic matter, is the most preferred food for oviposition and development of the nymphs of *M. scutellaris.*

Effect of temperature:

A number of workers including Allen (1920), Prasad (1956) and Byars (1960) have reported that temperature is the determining factor in seasonal distribution of organisms. During the present studies temperature of the water

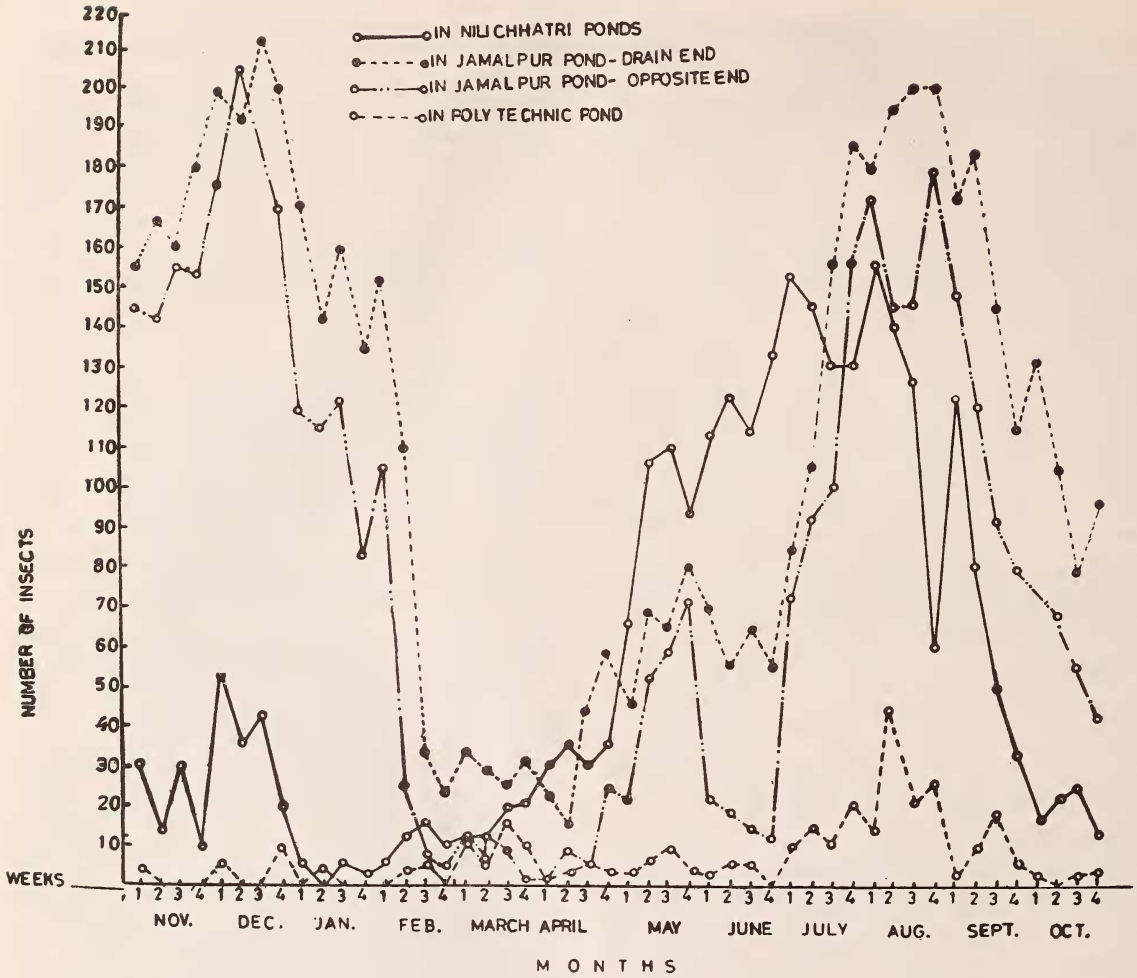

Fig. 1. Seasonal abundance of *Micronecta scutellaris* in different ponds.

of various sampling ponds ranged from 16.3° to 32.3°C. (Table 1). This range of temperature did not appear to determine the population density of *M. scutellaris.* The population of this species was sufficiently high in Jamalpur pond during the hot days of August (Temp. 32.0°C) and cold days of December (temp. 16.8°C). Therefore, during the present studies temperature, within the observed range of 16.3°-32.3°C did not affect the population density of *M. scutellaris.*

Effect of pH: Devic (1954) believes that pH is the most important chemical factor affecting the abundance of living organisms in the water. During the present studies pH of the water had a marked effect on the occurrence of *M. scutellaris.* Alkalinity of the water beyond pH 8.5 proved to be unsuitable for the occurernce of this species. During the period from February to June the water of

Jamalpur pond was alkaline and the pH ranged from 8.7 to 9.7 (Table 1), consequently the number of *M. scutellaris* was greatly reduced despite high percentage of organic matter. During this period abundant green algae appeared in the pond. The increase in pH might be due to rise in carbonate alkalinity resulting from photosynthetic activity of the algae (Unni 1972). Higher level of pH causes respiratory distress in the population of aquatic animals (Erichsen 1964). The observations confirm the earlier findings of Thornton and Wilhm (1974) who observed significantly lower survival of *Chironomas attenuatus* i.e. 0.92 per cent at a pH of 8.2 while the survival was 5.94 and 5.98 per cent at pH 6.2 and 7.2 respectively.

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